UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

SUBJECT:	CLEAN AIR ACT INSPECTION REPORT General Motors, LLC, Detroit-Hamtramck Factory ZERO, Detroit, MI
FROM:	Tess Russell, Environmental Engineer AECAB (MN/OH)
THRU:	Brian Dickens, Section Supervisor AECAB (MN/OH)
TO:	File

BASIC INFORMATION

Facility Name: General Motors, LLC, Detroit-Hamtramck Factory ZERO

Facility Location: 2500 E. Grand Blvd, Detroit, Michigan, 48211 (2 EJ indices >80th percentile, U.S. Census Block Group)

Date of Inspection: August 17, 2022

EPA Inspector(s):
1. Tess Russell, Environmental Engineer
2. Emma Leeds, Environmental Engineer
3. Laura Steel Neudorf, Environmental Engineer

Other Attendees:
1. Meghan Kennedy, Environmental Engineer, Environmental Compliance & Sustainability, GM
2. Jessica Alderton, Staff Environmental Engineer, GM Corporate
3. Megan Karie, Environmental Supervisor, GM
4. Scott Auger, Paint Shop Maintenance Planner, GM (during tour)

Contact Email Address: Meghan.kennedy@gm.com; margaret.marinkovski@gm.com

Purpose of Inspection: To determine compliance with the Clean Air Act, specifically Part 63, Subpart IIII and Part 60, Subpart MM; to determine compliance with the facility's Permit to Install (PTI) #209-19A

Facility Type: Electric Vehicle Manufacturer

Regulations Central to Inspection: 40 C.F.R. Part 63, Subpart IIII: National Emission Standards for Hazardous Air Pollutants: Surface Coating of Automobiles and Light-Duty Trucks (Auto MACT); and 40 C.F.R. Part 60, Subpart MM: Standards of Performance for Automobiles and Light Duty Truck Surface Coating Operations

Arrival Time: 8:30 AM ET
Departure Time: 12:00 PM ET

Inspection Type:
☒ Unannounced Inspection
☐ Announced Inspection

OPENING CONFERENCE

☒ Presented Credentials
☒ Stated authority and purpose of inspection
☐ Provided Small Business Resource Information Sheet
☒ Small Business Resource Information Sheet not provided. Reason: Not a small business.
☒ Provided CBI warning to facility

The following information was obtained verbally from Meghan Kennedy, Jessica Alderton, Megan Karie, or Scott Auger, unless otherwise noted.

Process Description: GM's Detroit-Hamtramck Factory ZERO was entirely re-imagined as of 2020 and now produces solely electric vehicles. The production process includes: 1) the body shop, 2) the paint shop, 3) paint shop sealers, 4) general assembly of vehicles, and 5) assembly of battery packs.

Vehicle pieces enter the body shop for spot and laser welding. The vehicle bodies then go to the paint shop for pre-treatment (acid etching) and electrodeposition (ELPO) coating, which contains an anti-rust formula. The car body is subsequently sent to one of two ELPO ovens. Next, the vehicle enters the paint shop sealers where both robotic and manual application of sealants occur: the primer spray booth and application of the monocoat, painting the vehicle top black. The vehicle body is cured in one of the two "primer ovens". Next the vehicle goes to the moist sand deck which preps the vehicle for the topcoat, consisting of application of a base coat [followed by a heated flash] and a clear coat [followed by oven curing]. The facility will have six identical topcoat lines when construction is complete. Finally, the vehicle pieces enter general assembly.

The facility has approximately 750-1000 employees currently, which is projected to increase with the ramp up in production, and currently operates 6a-2:30p Monday through Friday.

Staff Interview: In the body shop, sealer and adhesive emissions are released into the general in-plant air. Torit dust collectors are employed in some areas to reduce particulate release, primarily for Health and Safety protocols. According to facility representatives, pretreatment materials contain no VOC or HAP. The ELPO dip tank and its two associated ovens are controlled by the "oven RTO". The primer ovens, the heated flash following the base coat application, and the oven following the clear coat application are also controlled by the oven RTO. The oven RTO refers to the bank of two RTOs (210 and 220) with a common stack. The primer spray booth, the base coat spray booth, and the clear coat spray booth are all controlled by the "booth RTO". The booth RTO refers to the bank of three RTOs (110, 120, and 130) with a common stack.

The manufacturer recommendation sets the five RTO combustion chambers at 1525 degrees Fahrenheit, according to facility representatives. The permit states the facility must use this recommendation if no performance test has yet to be performed, which was the case at the time of the inspection. The permit requires the facility to monitor RTO chamber temperatures continuously but record once every 15 minutes. RTO operating temperatures were viewable both on the floor and on control computer screens; EPA requested these records. EPA also requested the results of the upcoming performance tests performed on the RTOs, as required by the PTI within 365 days after the beginning of saleable vehicle production. The PTI also requires the RTOs to be inspected annually, which facility representatives stated had just been completed. Fan speeds of the RTOs are not regularly monitored and are not required by the PTI. Facility representatives said that although the permit requires only the appropriate RTO portions to be operating for corresponding operations to continue, the facility typically runs all five RTOs.

Waterwash systems are present at the primer and topcoat (basecoat + clear coat) spray booths, under grates on the floor. Water flow is inspected visually on a weekly basis. EPA requested to see this documentation, as at least weekly visual inspections are required to be documented by the facility's PTI. Facility representatives said if water flow is too low, the paint booths automatically shut-off. The spray booths are also controlled via "booth balance", or downdraft, and dry filters located on the sides of the booths, which are inspected weekly.

The primer, monocoat, and clear coat are solvent-based paints; the basecoat is waterborne-based paint. Facility representatives stated that the facility complies with the "uncontrolled" version of the Auto MACT because the paints have such low HAP content. The primer and clearcoat spray booths also have purge solvent collection systems to control HAP emissions, as required by the Auto MACT. Recovered solvent goes into a tank, is treated as hazardous secondary material, and is sent back to the supplier for recycling/repurposing.

Facility representative stated that the only minor emissions that originate from the general assembly include those from glass bonding and fluid fill, which are released to in-plant air. The only minor emissions that originate from the assembly of the battery packs include those from sealers, which are also released to in-plant air. While sealers in the body shop and battery assembly are uncontrolled, facility representatives said they are low-VOC sealers, composed of approximately 0.03 lb VOC/gal. EPA has requested documentation to investigate the facility's compliance with all VOC limits required by 40 C.F.R. Part 60, Subpart MM.

The facility is slated to have 6 topcoat modules. Currently, 1 and 2 are in full production. 3-5 are currently under construction. 6 has not been constructed yet. At the time of the inspection, the facility produced five vehicles per day (considered "low production"), but the ultimate goal is 45 vehicles per hour ("high production"). According to the PTI, the facility will exit the "low production" period once it produces more than 10,000 vehicles in a 12-month rolling period, or 36 months after start-up, whichever comes first. The facility expected to receive its new Renewable Operating Permit by mid-September 2022.

TOUR INFORMATION

EPA Tour of the Facility: Yes

Data Collected and Observations:
EPA observed the body shop, with welding activities; buckets of sealers and sealer purge; and one of the Torit dust collectors. Next EPA observed the paint shop with pretreatment and the ELPO dip tank with three water rinses, and the paint shop sealer area. The observed average combustion chamber temperatures were 1525°F for RTO 110, 1533°F for RTO 120, 1525°F for RTO 130, 1530°F for RTO 210, and 1543°F for RTO 220. EPA observed the washwater systems and dry filters in the primer and topcoat spray booths.

Photos and/or Videos: were taken during the inspection.

Field Measurements: were not taken during this inspection.

CLOSING CONFERENCE

☒ Provided U.S. EPA point of contact to the facility

Requested documents:

- The number of current adhesives and sealants used at the facility [and the ultimate number, after production ramps up]
- The performance test report(s) for the RTOs
- The last year's worth of temperature data for the RTOs (Sept 2021- August 2022)
- Record of any RTO downtime when processes are occurring (Sept 2021- August 2022)
- Last two months of waterwash inspections for the primer and topcoat booths
- Malfunction abatement plan (MAP)
- Notice of compliance for Subpart MM [auto MACT]
- Air emission calcs + supporting calculations/spreadsheets (Sept 2021 – August 2022)
- Provide the types of welding wires used in the Body Shop

DIGITAL SIGNATURES

Report Author: Russell, Tess Digitally signed by Russell, Tess Date: 2022.10.14 09:19:44 -05'00'

Section Supervisor: Miller, Patrick Digitally signed by Miller, Patrick Date: 2022.10.14 15:37:46 -05'00'

APPENDICES AND ATTACHMENTS

1. Appendix A: Digital Image Log

Facility Name: General Motors, LLC, Detroit-Hamtramck Factory ZERO
Facility Location: 2500 E. Grand Blvd, Detroit, Michigan, 48211
Date of Inspection: August 17, 2022

APPENDIX A: DIGITAL IMAGE LOG

1. **Inspector Name:** Laura Steel Neudorf	2. **Archival Record Location:** ERC

Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
1	IMG_0168.JPG	2022:08:17 09:05:09 CST	Body shop; sealer (right) and sealer purge (left)
2	IMG_0169.JPG	2022:08:17 09:08:15 CST	Spot welding
3	IMG_0170.JPG	2022:08:17 09:08:22 CST	Spot welding (2)
4	IMG_0171.JPG	2022:08:17 09:09:00 CST	Spot welding (3)
5	IMG_0172.JPG	2022:08:17 09:30:20 CST	ELPO dip tank and ELPO ovens RTO ducts
6	IMG_0173.JPG	2022:08:17 09:42:18 CST	RTO 110 Control Screen
7	IMG_0174.JPG	2022:08:17 09:42:51 CST	RTO 110 Control Screen (2)
8	IMG_0175.JPG	2022:08:17 09:50:32 CST	Grates and waterwash system at bottom of primer spray booth
9	IMG_0176.JPG	2022:08:17 09:52:46 CST	Dry filters in primer spray booth
10	IMG_0177.JPG	2022:08:17 09:53:00 CST	Dry filter in primer spray booth (2)